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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,367	09/26/2003	Akiharu Fukuda	Q77458	6876
23373	7590	06/29/2004	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			MILLER, ROSE MARY	
			ART UNIT	PAPER NUMBER
			2856	

DATE MAILED: 06/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/670,367

Applicant(s)

FUKUDA ET AL.

Examiner

Rose M Miller

Art Unit

2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1 is/are allowed.
- 6) ☒ Claim(s) 2 and 5-8 is/are rejected.
- 7) ☒ Claim(s) 3 and 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/26/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 5-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5-6 are rejected as being indefinite as the phrase "the windows", found on line 3 of claim 5, lacks a proper antecedent basis. Claim 2, from which claim 5 depends, fails to recite the use of "windows" for the ultrasonic sensor. As the "windows" are not an inherent part of the structure recited in claim 2, the phrase lacks a proper antecedent basis.

The first occurrence of the windows appears in claim 3. A suggestion for correction is to change the dependency of claim 5 from claim 2 to claim 3.

Claim 6 is rejected as it fails to correct the problems presented in Claim 5.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Minami et al. (US 2003/0156585 A1)** in view of **JP 61-125784** (hereafter referred to as **JP 61**).

Minami et al. discloses a tilt angle measuring apparatus comprising a plurality of ultrasonic transducers (see Figures), a signal processing means that controls the ultrasonic sensors and computes a tilt angle (see Figures), and horn parts directly below the ultrasonic sensors (see Figure 31).

Minami et al. discloses the claimed invention with the exception of the tilt angle measuring apparatus including a casing that houses the ultrasonic sensors and the signal processing means, the casing including a case body arranged on a vehicle side, a holder that holds the ultrasonic sensors and is supported in the case body, and the horn parts being part of a cover the covers a lower portion of the holder.

JP 61-125784 teaches the advantages of having an ultrasonic sensor system in a casing that houses the ultrasonic sensor and the signal processing means, the casing including a case body (7) arranged on a vehicle side (see Figures), a holder that holds the ultrasonic sensors and is supported in the case (transducer mounting, see Figures), and the horn parts being part of a cover that covers the lower portion of the holder (see Figure 6).

Therefore, it would have been obvious to one of ordinary skill in the art to include the casing and the specifics of the casing as claimed in the invention of **Minami et al.** as **JP 61-125784** teaches the advantages of having all of the hardware for the sensor in a single location for ease of testing and replacing if necessary.

As for claim 7, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the casing with water draining holes as one of ordinary skill in the art would know the environment in which the apparatus is to be operated. If such an environment exposes the sensor to conditions that would result in the buildup of either rain or condensation within the sensor, then one of ordinary skill in the art would know that a simple inexpensive way to compensate for such buildup would be to provide drain holes to in order to prevent the buildup of water in the sensor.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Minami et al.** in view of **JP 61-125784** as applied to claim 2 above, and further in view of **Obayashi et al. (US 4,677,595)**.

Minami et al. in view of **JP 61-125784** discloses the claimed invention with the exception of the tilt sensor comprising members that are arranged to surround the horn parts and absorb or interrupt the ultrasonic wave. **Obayashi et al.** teaches the need for isolating a sensor mounted on a vehicle from extraneous noise produced both in the vehicle and outside the vehicle. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide absorbing members around the horns of the apparatus in order to prevent outside noise or ultrasonic signals from producing errors in the test result. One of ordinary skill in the art would have also known that such absorbing members would reduce or eliminate the cross-talk produced between adjacent transducers and again allow for a better test result.

Allowable Subject Matter

7. Claim 1 is allowed.
8. Claims 3-4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
9. Claims 5-6 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.
10. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to teach and/or suggest a tilt angle measuring apparatus comprising, in combination with the other recited elements, both a bottom plate having windows, each of which exposes a face of an ultrasonic sensor, and horn parts, each of which extends downward from the bottom plate so as to surround each of the windows.

Art Unit: 2856

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Guscott et al. (US 4,228,379) discloses a diaphragm type piezoelectric electroacoustic transducer.

Naruse (US 4,754,440) discloses an ultrasonic transducer.

Thelen et al. (US 5,038,612) discloses an ultrasonic measuring device with a specific supporting structure.

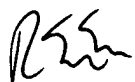
Kawashima (US 6,085,592) discloses an ultrasonic sensor and obstruction detector.

Katayama (US 2003/0154792 A1) discloses an inclination angle measurement apparatus.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rose M Miller whose telephone number is 571-272-2199. The examiner can normally be reached on Monday - Friday, 7:30 am to 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



RMM
26 June 2004



HEZRON WILLIAMS
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